

What is claimed is:

1. A method of producing an improved organism having a desirable trait comprising:  
a) obtaining an initial population of organisms, b) generating a set of mutagenized organisms, such that when all the genetic mutations in the set of mutagenized organisms are taken as a whole, there is represented a set of substantial genetic mutations, and c) detecting the presence of said improved organism.
2. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of a knocking out of at least 15 different genes.
3. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of a knocking out of at least 50 different genes.
4. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of a knocking out of at least 100 different genes.
5. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of an introduction of at least 15 different genes.
6. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of an introduction of at least 50 different genes.
7. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of an introduction of at least 100 different genes.
8. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of an alteration in the expression of at least 15 different genes.
9. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of an alteration in the expression of at least 50 different genes.

10. The method of claim 1, wherein the set of substantial genetic mutations in step b) is comprised of an alteration in the expression of at least 100 different genes.

11. A method of producing an improved organism having a desirable trait comprising:  
a) obtaining an initial population of organisms, b) generating a set of mutagenized organisms each having at least one genetic mutation, such that when all the genetic mutations in the set of mutagenized organisms are taken as a whole, there is represented a set of substantial genetic mutations c) detecting the manifestation of at least two genetic mutations, d) introducing at least two detected genetic mutations into one organism, and e) optionally repeating any of steps a), b), c), and d).

12. The method of claim 11, wherein step d) is comprised of a knocking out of at least 15 different genes in one organism.

13. The method of claim 11; wherein step d) is comprised of a knocking out of at least 50 different genes in one organism.

14. The method of claim 11, wherein step d) is comprised of a knocking out of at least 100 different genes in one organism.

15. The method of claim 11, wherein step d) is comprised of an introduction of at least 15 different genes into one organism.

16. The method of claim 11, wherein step d) is comprised of an introduction of at least 50 different genes into one organism.

17. The method of claim 11, wherein step d) is comprised of an introduction of at least 100 different genes into one organism.

18. The method of claim 11, wherein step d) is comprised of an alteration in the expression of at least 15 different genes in one organism.

19. The method of claim 11, wherein step d) is comprised of an alteration in the expression of at least 50 different genes in one organism.

20. The method of claim 11, wherein step d) is comprised of an alteration in the expression of at least 100 different genes in one organism.

21. A method for identifying a gene that alters a trait of an organism, comprising: a) obtaining an initial population of organisms, b) generating a set of mutagenized organisms, such that when all the genetic mutations in the set of mutagenized organisms are taken as a whole, there is represented a set of substantial genetic mutations, and c) detecting the presence an organism having said altered trait, and d) determining the nucleotide sequence of a gene that has been mutagenized in the organism having the altered trait.

22. A method for producing an organism with an improved trait, comprising: a) functionally knocking out an endogenous gene in a substantially clonal population of organisms; b) transferring a library of altered genes into the substantially clonal population of organisms, wherein each altered gene differs from the endogenous gene at only one codon; c) detecting a mutagenized organism having an improved trait; and d) determining the nucleotide sequence of an gene that has been transferred into the detected organism.